

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

POND SEALING OR LINING - FLEXIBLE MEMBRANE

(no.)
CODE 521A

DEFINITION

A manufactured hydraulic barrier consisting of a functionally continuous sheet of synthetic or partially synthetic, flexible material.

PURPOSE

To control seepage from water and waste impoundments for water conservation and environmental protection.

CONDITIONS WHERE PRACTICE APPLIES

On ponds and water storage structures that require treatment to control seepage rates within acceptable limits.

On waste storage and waste treatment facilities built in or of excavated earth, and which require treatment to prevent the migration of contaminants from the site.

CRITERIA

Structures to be lined shall have been constructed to meet all applicable NRCS standards. All inlets, outlets, ramps, and other appurtenances may be installed before, during, or after the liner placement, but shall be done in a manner that does not damage or impair the proper operation of the liner.

All flexible membranes shall be certified by the manufacturer to be suitable for the intended use.

Design of the flexible membrane shall be in accordance with manufacturer recommen-

dations. All flexible membrane installations shall meet the material and installation requirements of the plans and specifications provided for each installation, and shall be certified by the installer.

Minimum Criteria for Membranes	
Type	Limiting Parameter
HDPE	40 mil thickness
LLDPE	40 mil thickness
PVC	30 mil thickness
GCL	0.75 lb./sq ft (bentonite)
EPDM	45 mil thickness
CSPE	30 mil thickness

HDPE = High Density Polyethylene
 LLDPE = Linear Low Density Polyethylene
 PVC = Polyvinyl Chloride
 GCL = Geosynthetic Clay Liner
 EPDM = Synthetic Rubber (*butyl*)
 CSPE = *Chlorosulfonated Polyethylene (hypalon)*

Select soil materials shall be used as cover for liners where required for the proper performance, protection, and durability of the installation. Cover soils shall not contain sharp, angular stones or any objects that could damage the liner. Maximum allowable particle size of soil cover material shall be 3/8-in (10 mm), unless the liner is cushioned by a needle punched, non-woven geotextile. Cover materials shall be stable under all operational and exposure conditions.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Subgrade preparation shall conform to manufacturer recommendations. Subgrade materials shall not contain sharp, angular stones or any objects that could damage the liner or adversely impact its function.

All structures shall be fenced to protect the liner from damage and for the safety of humans, livestock, wildlife, and pets.

Manufacturer recommendations shall be followed with regard to protection from weather and exposure.

If venting is used, manufacturer recommendations shall be followed regarding vent type and spacing.

Lined areas should be sloped no steeper than 3 horizontal to 1 vertical for exposed lining and 2.5 horizontal to 1 vertical for buried linings. The side slope requirements of the membrane manufacturer shall also be met.

Membranes that require a cover will have a minimum cover of earth or earth and gravel not less than 6 inches thick. The bottom 3 inches of cover should not be coarser than silty sand.

CONSIDERATIONS

Venting should be considered if gas build up under the liner is anticipated.

If high water tables could adversely affect the proper functioning of the facility, interceptor or relief type drainage systems should be considered to control uplift pressures.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for specific field sites in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended uses.

Construction plans should list the area of lining, material requirements, thickness of cover, trench dimensions, and side slopes.

OPERATION AND MAINTENANCE

A plan for operation and maintenance of the liner shall be prepared.

The following guide shall be completed and used to document the operation and maintenance recommendations for the practice:

- *Operation and Maintenance Guide For Your Pond Sealing and Lining – Flexible Membrane.*

The guide shall be given to the client along with the construction plans and specifications for the practice.